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nomenclature of historical geology. Thus opposite page 33 is a folding tabular view giving the European equivalents, with successive parallel columns giving the formation names in Southern Cape Colony, Northern Cape Colony, Orange River Colony, Natal, Rhodesia, and the Transvaal. An extended bibliography is included, also an index of place-names and a general index.

The evidence of glaciation in Carboniferous times (*Devika Conglomerate*) is given, but perhaps with less fulness than in the volume on Cape Colony. The same conclusions are, however, fully accepted. The chapter on diamond-bearing deposits, following many sections of local geological descriptions, will, perhaps, have the most interest to the general reader. The diamonds are found in a serpentine breccia, occurring in "pipes" which, with a more or less vertical altitude, penetrate the stratified rocks, whereas these gems are in many regions found in alluvial or washed beds.

The breccia is of volcanic origin, having been forced up through the sedimentary strata. The pipes contain many fragments of these inclosing bed-rocks which have been torn away in the violent ascent. The diamonds occur in many crystal combinations, and with a wide range of size. A remarkably large specimen, known as the Cullinan stone, found in January, 1905, near Pretoria, has a weight of 3,024¾ carats, equivalent to 1.37 lbs. avoirdupois. Some of the volcanic pipes, while resembling the rest in all other respects, yield no diamonds.

The first stone found was picked up on the bank of the Orange River in 1867 by a Dutch farmer. It was exhibited at the Paris Exposition, and ultimately purchased by the Governor of Cape Colony for the sum of \$2,500. The surface area of the Kimberley mine comprises nearly 10½ acres, including 470 claims. In January, 1904, the main shaft had been sunk to a depth of 2,599 feet. Descriptions are given of the mines of Cape Colony, Orange River Colony, and the Transvaal.

As to the origin of the pipes, the authors favour the view that they are due to volcanic explosions, with abundant steam, accounting thus for the mud-like character of the mass. As to the origin of the gems themselves there seems to be much confusion of opinion.

A. P. B.

First Report on the Relations between Climates and Crops. By **Cleveland Abbe.** U. S. Department of Agriculture, Weather Bureau. Bulletin No. 36. 8vo. Washington, D. C., 1905. Pp. 376. (Price, \$1.50.)

There is always a very active interest on the part of the large portion of every community in the relations between climate and weather on the one hand and the yield and character of the crop on the other. This interest is not confined solely to farmers and meteorologists; it extends to that larger body of persons who are directly or indirectly affected by the harvest. Professor Cleveland Abbe, some years ago made a thorough and careful compilation and summary of the best published results on the whole subject of the relations of climate and crops up to the year 1891. This report, officially known as "No. 5119, Sig. 91," was ready for publication at that time, but for various reasons it could not then be printed. Having had the opportunity ourselves to look over Professor Abbe's paper some years ago, and having realized its importance from many points of view, we have been hoping for publication these past ten years. It is a pleasure to record the appearance of this report in print, as *Bulletin* No. 36 of the Weather Bureau. The words *First Report* at the beginning of the title are a pleasing indication that in time we may have a second report, bringing the subject up to date.

Professor Abbe's intention in the preparation of his summary was to notice only those investigations that have given precise information as to specific plants or crops and specific localities; he has made a thorough search of all the more important literature, in so far as accessible to him, and the result is a useful handbook of reference for agriculturists, teachers of botany and climatology, and investigators along various lines of agricultural and botanical research. The agricultural colleges and agricultural experiment stations were especially in the mind of the author in the preparation of this volume. At the present time, when our Department of Agriculture is devoting so much attention to the introduction of new plants which shall be better adapted to climatic conditions in different parts of our country than those previously cultivated, this book will be of special interest to the scientific farmers of the United States. Professor Abbe's immediate purpose is stated by him in his preface in the following words:

As far as practicable, I have presented, in the words of the respective authors, the results of their own investigations on the points at issue, my own duty being not to undertake any extensive original study, but to merely connect their results together in a logical manner, to collect data for future general use, and to suggest or stimulate further inquiry on the points here presented.

The volume is very valuable in giving first-hand information, on the various aspects of the subjects with which it deals, in a compact form, easily accessible, well arranged, and fully indexed. The work is divided into four parts. Part I concerns *Laboratory Work, Physiological and Experimental*. Part II deals with *Open-Air-Work—Experience in Natural Climates*. In Part III, *Statistical Farm Work*, the crops and climates of the United States are considered. Part IV contains the bibliography and index. It is obvious that such a report as this will prove widely useful, and it is our hope that Professor Abbe will soon be able to prepare, and the Weather Bureau be able to publish, an extension of the work up to date.

R. DEC. W.

Der Rhein und sein Verkehr, mit besonderer Berücksichtigung der Abhängigkeit von den natürlichen Verhältnissen. Von Dr. Friedrich Wickert, in Wiesbaden, 148 pp., 2 maps, 29 diagrams. Stuttgart, J. Engelhorn, 1903.

Based upon very thorough search among German official and other literature on the great water-artery of central Europe, this book upon the Rhine and its relations to transit, trade, and industry is certainly a most deserving achievement. Necessarily, it is a compilation; but this conveys no reproach. Data, and data as copious and exact as those furnished by Dr. Wickert, can only be obtained from an abundance of documents. Fortunately, German literature on the subject is exceedingly full of information, and, still more fortunately, the author is most competent to make use of it. Clear and concise in his statements, moderate in his deductions and conclusions, he places before the student a wealth of material of the most positive sort, and never indulges in side-flings at extra-German countries and doings, such as often make German literature since the "great rise" of Germany in 1870-1871 so uselessly obnoxious. His language is plain and matter-of-fact, nothing more nor less.

His descriptions of the Rhine from the sources in southeastern Switzerland to the frontier of Holland could hardly be more exact. The allusions in it to the origins and movements of drift are well put and characteristic. With rivers of an alpine origin, two factors must be carefully considered. One, the amount and kind of drift they carry; the other, the periodical perturbances created by the